

ALTERNATIVE FUELS MASTER PLAN for MIAMI INTERNATIONAL AIRPORT



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Topics

- MIA Capital Improvement Plan
- MIA's History with Alternative Fuels
- New Approach to Alternative Fuels
- AFMP Development
- AFMP Results
- AFMP Costs
- Summary/Future Activities



MIA Capital Improvement Plan

- \$4.8 Billion Through 2007
 - New 47 gate concourse
 - Expansion of cargo facilities
 - Creation of 4th runway
- Environmental/Energy Concerns
- Airport-Wide Goals Instituted
 - Volatile organic compound (VOC) reduction of 10% by year 2010
- Alternative fuels in vehicles and ground support equipment is one solution
 - Need for Alternative Fuels Master Plan (AFMP)



MIA's History with Alternative Fuels

- CNG vehicles
 - OEM and conversions
 - Admin vehicles (pickups, sedans, vans) and buses
- Landside CNG refueling station installed in 1996
- Issues
 - Lack of fleet personnel support for CNG
 - CNG conversion technology problems
 - Refueling station operational issues
 - Compressor maintenance/poor vendor support
 - Long vehicle refueling operation
 - Excessive compressor fuel consumption



New Approach to Alternative Fuels

- Clean Sheet Approach
- Consider Current and Future Fuels Technologies (AFV, all-electric, hybrid)
 - Technical merits
 - Regional Availability
 - Costs
- Goals:
 - 10% VOC reduction
 - Solution(s) must be cost-effective
 - Target date: 2010



AFMP Development

- Consultant Support
 - EA Engineering and Antares Group
- Comprehensive Analysis
 - MDAD Fleet Focus Initially
 - Vehicles: fuel usage, emissions, costs (operating maintenance, lifecycle)
 - Fueling: infrastructure costs (operating maintenance, lifecycle)
- Evaluated MDAD Landside and Airside Operations
 - Alternative fuels (CNG, LNG, LPG, biodiesel, E85, electric)
 - Advanced technologies (all-electric, Hybrids & NEV)
- 2004 to 2010 Timeframe
- Plan is Currently Under MDAD Management Review



AFMP Results

- Three AFV Implementation Scenarios
 - Comparisons using lifecycle and cost-benefit analysis
 - Best scenario: E85 (cars, LD pickups, SUVs), biodiesel (employee shuttle buses), and hybrid-electric/electric (baggage tugs).

Total AFVs Implemented (2004 to 2010)

327

Total Petroleum Reduced (2004 to 2010)

863,357 GGE

% Petroleum Reduced from Baseline

26.1

Total VOC Reduced (2004 to 2010)

10.1 ton

% VOC Reduced from Baseline

14.1



AFMP Costs

- Capital Costs
 - Total incremental vehicle cost (2004 through 2010) = \$100,000
 - Fuel infrastructure (2004 through 2010) = \$125,600
- Operating Costs
 - Annual alternative fuel prices are higher
 - Periodic battery replacement costs for all-electric and hybrid-electrics
 - Biodiesel fuel filter changes
 - Reduced cost for baggage tugs (gasoline → EV/HEV)



Summary/Future Activities

- Near-Term AFMP Implementation
 - Learn through experience
- AFMP Meets the VOC Reduction Goals while reducing fuel usage
- Current “Biodiesel Feasibility Study” of Airside Mobile Diesel Equipment
- Outreach to Airport Tenants → Long-Term Goals
 - Broader utilization of AFVs
 - Lower fuel costs
 - Greater environmental benefits

